III.—*On the Importance of Economizing and Preserving our Forests.*

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At first sight, forests appear to the settler in a wooded country as obstacles to advancing civilization, to be removed as rapidly as possible, and with unwearied zeal and persistence in the use of axe and fire the encumbrances are soon disposed of. The stock of fertility accumulated by the long continued annual fall and decay of the leaves is utilized in the growth of cereals for man's sustenance, and in his zeal to get rid of the trees, the owner seldom reflects on the inestimable value of woods in providing shelter against storms, in equalizing temperature and moisture, and in purifying the atmosphere.

Perhaps the most obvious modification of climate by forests is in arresting wind, subduing its power in a greater degree than a solid barrier would, the limbs entangling and killing its force in a marked degree. Even a single tree has a wake of calm stretching away to a considerable distance, while a forest of deciduous trees absolutely arrests the wind near the earth. A windy climate is generally an unhealthy one, as indicated by the marked increase in mortality during and following the long continued prevalence of cold winds.

Forests also equalize violent alternations of heat and cold; the temperature is lower in summer and higher in winter in the forest than in the adjacent open ground. During the heated term the umbrageous foliage protects the soil from the direct action of the sun's rays, while every leaf by the evaporation of moisture from its surface acts as a refrigerator on the air immediately adjacent. In winter the heat which has been absorbed by the water with which the soil is charged also by the earth is slowly given up, and, added to the minute quantity of heat given forth by the living trees themselves, forms a reservoir of warmer air, which is slowly displaced in severe weather and mitigates its severity; indeed the forest is a treasurer of the elements of climate, hoarding excesses and distributing in times of need.

Forests also exercise a governing and conservative influence on the humidity of the atmosphere. The roots of trees act in a measure like conduits, admitting the rain water into the sub-soil, while over this lies a stratum of humus, highly absorbent, and on the surface a layer of decaying trees, the whole acting something like an enormous sponge holding a vast quantity of surface water reserved for the heated season. Then, when the need for it is most urgent, it is elevated to the upper surface and distributed to the parched air by evaporation from the leaves, as already stated.

Forests also influence rainfall; trees indeed are most singularly complicated condensers, their limbs, boughs, and leaves being a sort of natural machinery, wonderfully adapted to the purpose of grasping upon the atmosphere and causing those dynamic changes which induce precipitation of moisture.

Trees purify the soil. The pollution constantly going on about our dwellings charges

the soil with organic matter, which the roots of trees search out, follow and feed upon, and alter it as completely as if it were burnt, and elevate it into the upper air in forms of beauty.

Data for the investigation of the influence of forests on the all-important question of rainfall, must be looked for in the eastern part of the world, where deforestation has been greatest, and where large districts have thus been entirely altered in their character and capabilities.

When the Jews first settled in Palestine it was a proverbialy fertile country, a land flowing with milk and honey, and favored with a pleasant climate. Then the mountain ranges of the country were densely covered with forests, in which the stately cedar of Lebanon held a prominent place. The gradually increasing population of Palestine enjoyed comfort and abundance during many centuries, but a gradual devastation of the forests, which was finally completed by their enemies, produced a wonderful change. The hills of Galilee, once rich pasturing grounds for large herds of cattle, are now sterile; the Jordan has become an insignificant stream, and several beautiful smaller rivers mentioned in the Bible, appear now as stony runs, which carry off the surplus water resulting from the melting snow in spring, but are completely dry during the greater part of the year. Some few valleys enriched by the soil which has been washed down from the hills, have retained a portion of their fertility, but the country as a whole is arid and desolate and not capable of sustaining one-fourth of the population it contained in the time of Solomon.

Under the reign of the Moorish Caliphs, the Iberian peninsula resembled a vast garden, yielding grain and fruit in the greatest abundance. Then the sierras and mountain slopes were covered with a luxuriant growth of timber, which was afterwards wantonly destroyed under the rule of the Christian kings, while large herds of half wild goats and sheep prevented the spontaneous growth of trees which would otherwise have taken place on the neglected lands. Now nearly all the plateau lands of Spain are desert-like and unfit for agriculture, because of the scarcity of rain.

Portions of Sicily, Greece, Italy, France, and other European countries have suffered in like manner, and the plains and hillsides, once luxuriant with verdure, yield now but scanty crops, or are converted into arid wastes. In France the government has adopted a regular system of forest planting, which is proving a great success, and which in course of time will doubtless remedy the evils complained of, repay the expenses incurred and yield a revenue to the public treasury.

Germany, which had also suffered from deforestation, was one of the first European nations to set to work energetically and systematically to remedy it by extensive planting. The work was begun nearly two hundred years ago, and during this period the country has been brought from the condition of a wood famine to a state in which there is now grown annually more wood than the country needs to use. It is estimated that with the systematic planting now regularly carried out, Germany can cut from ten to fifteen billions of feet of lumber from its thirty-five millions of acres of wood lands yearly, for all time to come, a product from which the State is said to receive a net revenue of nearly forty millions of dollars per annum. Besides all this, while in many other countries the climate and soil have deteriorated to an alarming extent, Germany has gained in fertility, and tracts of

formerly worthless land have been brought under successful culture, and the climate, if it has not improved, as some claim, at least has not deteriorated.

Other countries are following the example of Germany, and systematic forest-planting is now being faithfully carried out, not only in Europe, but in India and Australia.

In our own country, although we have not yet felt any ill effects from the partial removal of our woods, yet the timber supply is being so rapidly exhausted, that the question of replanting must before long engage the serious attention of our people. At the present rate of consumption and destruction, it is estimated that the twentieth century will see the greater portion of the American continent well nigh denuded of its forests. The disastrous consequences of a dearth of timber in Canada would be difficult to describe; it would interfere sadly with the further settlement of our country and paralyse our industries.

Stricter regulations are needed to prevent the unnecessary destruction of timber by the lumberer, and by the forest fires which often arise from wanton carelessness, and entail immense losses. Some measures looking to the replanting of denuded districts should also be introduced.

In the comparatively treeless portions of our great Northwest Territory, a marked improvement in the climate might be effected by judicious and extensive tree planting; and in all parts of our Dominion endeavors should be made to excite a general interest in this subject, and to create a healthy sentiment in favor of preserving, with greater care, the remnants of the noble forest with which our country was once clothed.